Figure 1

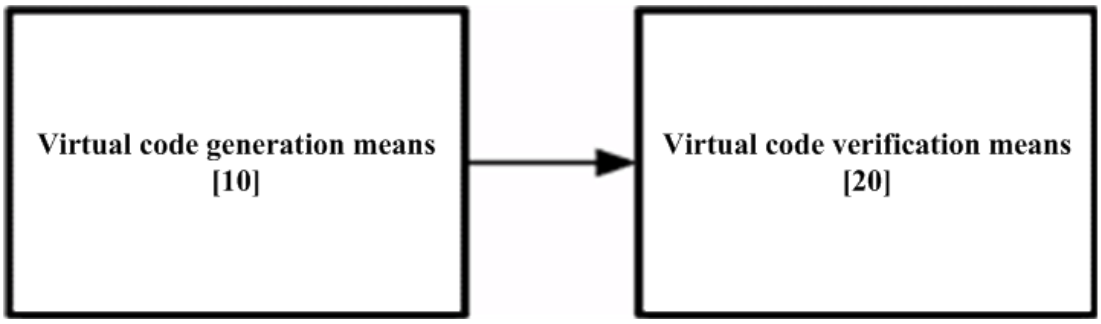

Virtual code generation means
[10]
Virtual code verification means
[20]

Figure 2

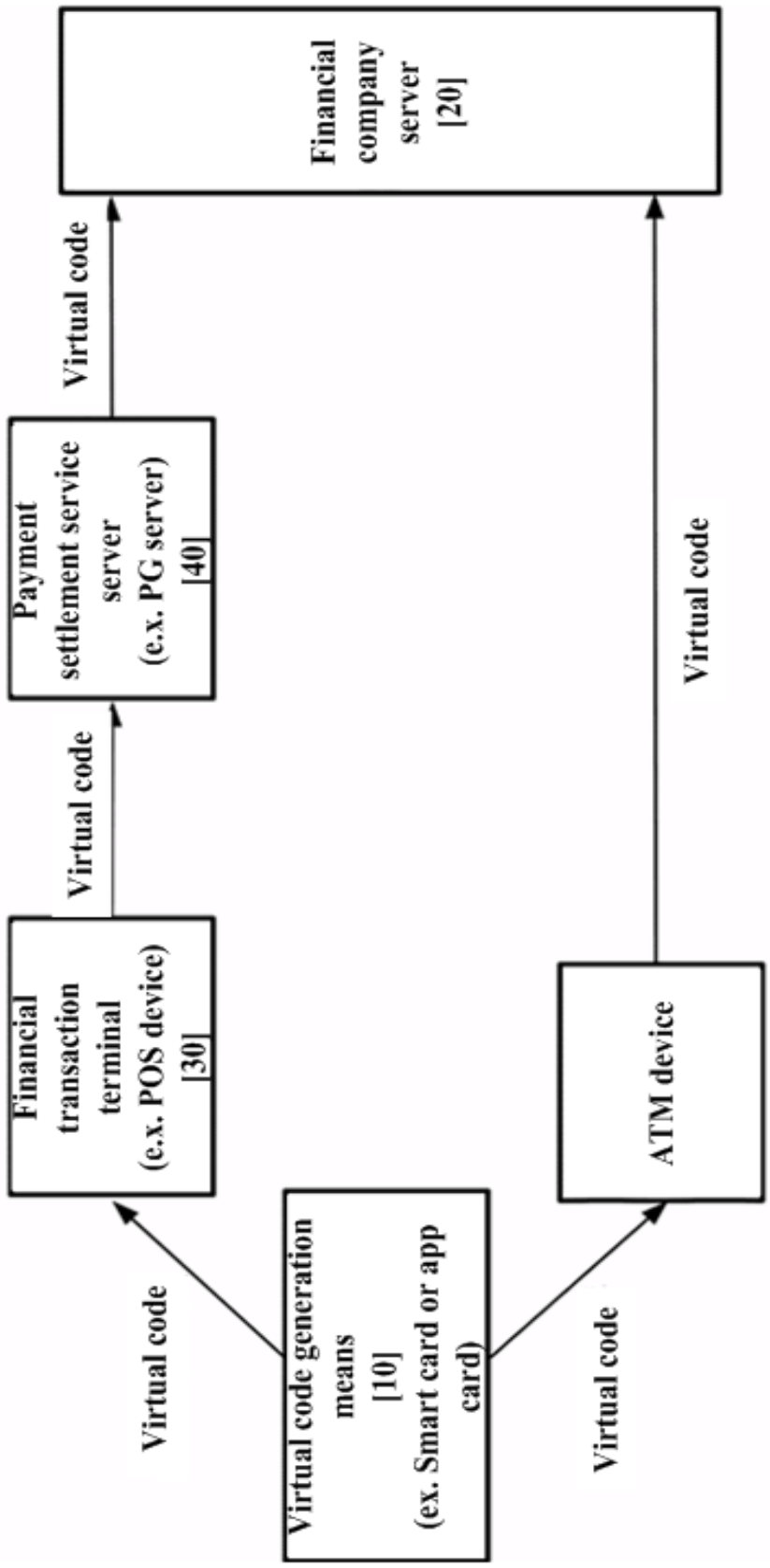

Financial company server [20]
Virtual code
Payment settlement service server (e.x. PG server) [40]
Virtual code
Financial transaction terminal (e.x. POS device) [30]
Virtual code
Virtual code generation means [10] (ex. Smart card or app card)
Virtual code
ATM device
Virtual code

Figure 3

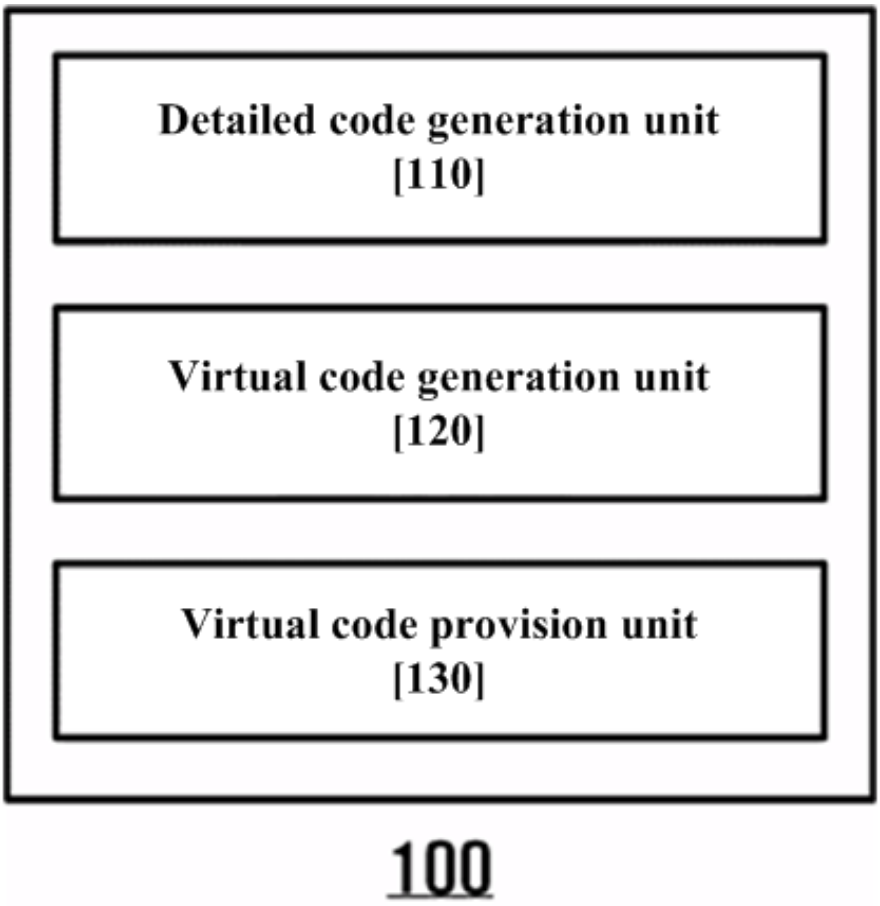

Detailed code generation unit
[110]
Virtual code generation unit
[120]
Virtual code provision unit
[130]
100

Figure 4

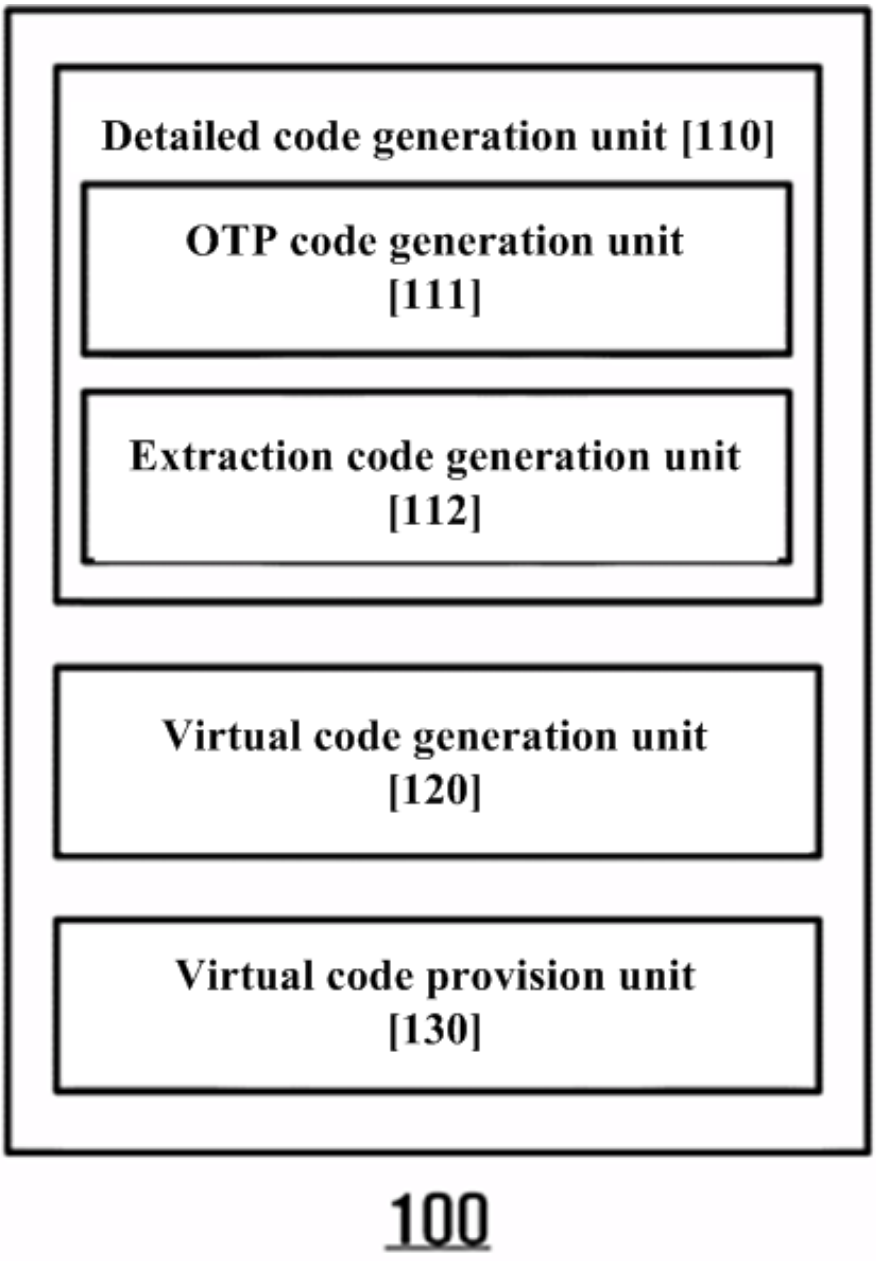

Detailed code generation unit [110]
OTP code generation unit [111]
Extraction code generation unit [112]
Virtual code generation unit [120]
Virtual code provision unit [130]
100

Figure 5A

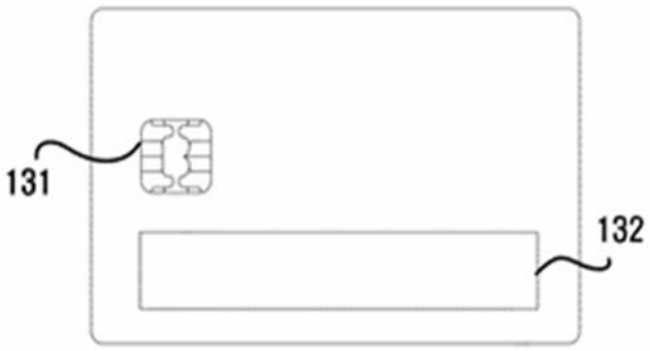


Figure 5B

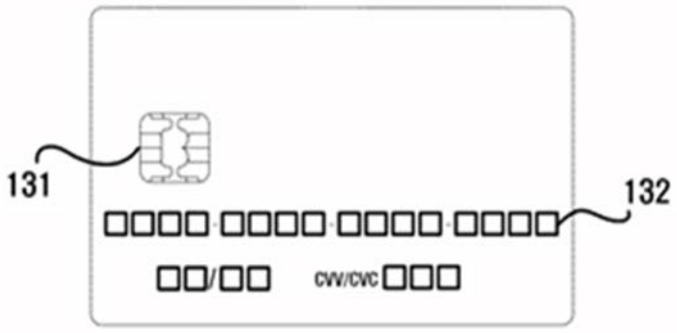


Figure 5C

Figure 6

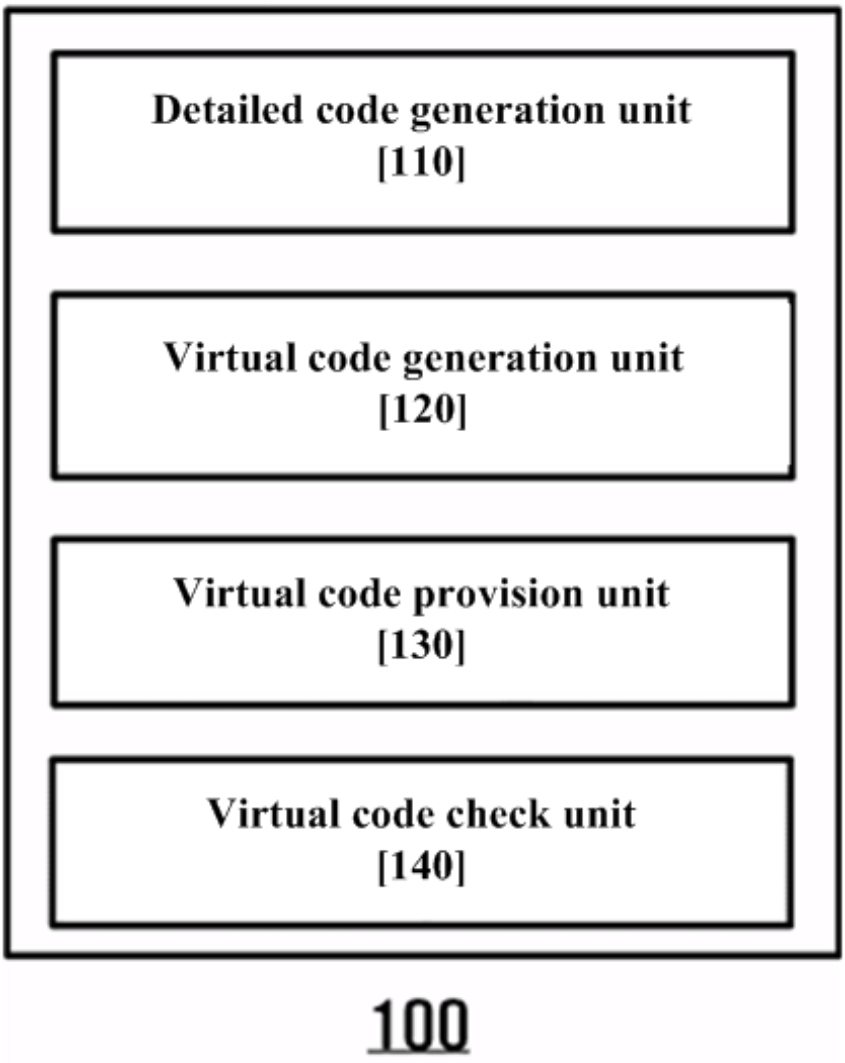

Detailed code generation unit
[110]
Virtual code generation unit
[120]
Virtual code provision unit
[130]
Virtual code check unit
[140]
100

Figure 7

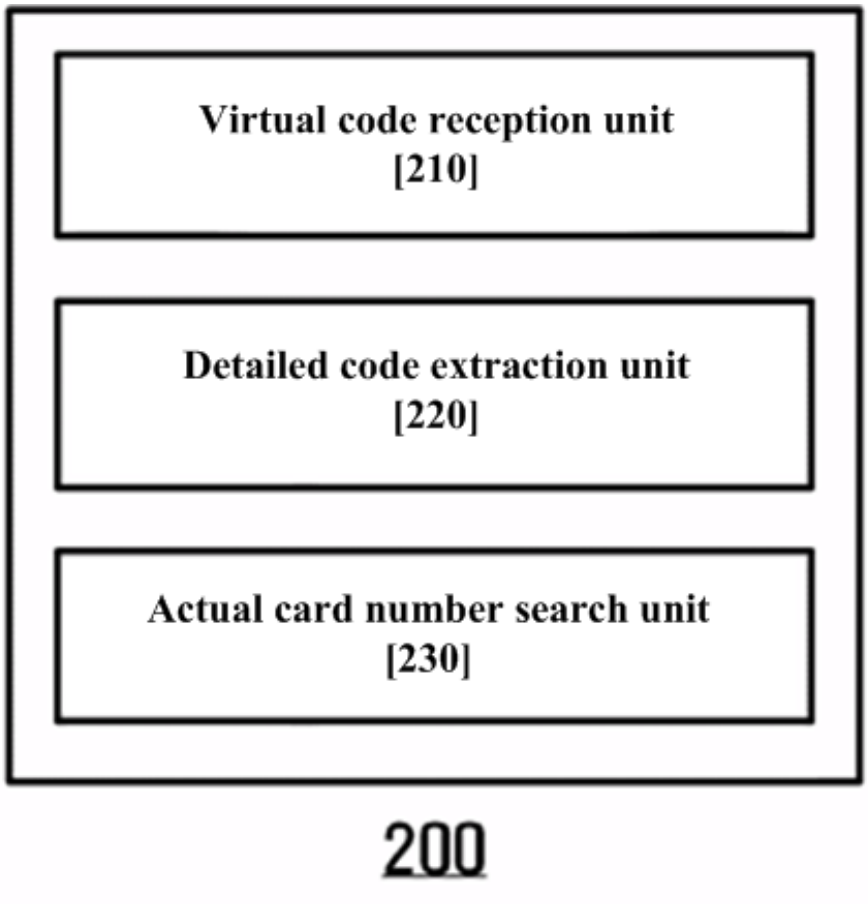

Virtual code reception unit
[210]
Detailed code extraction unit
[220]
Actual card number search unit
[230]
200

Figure 8

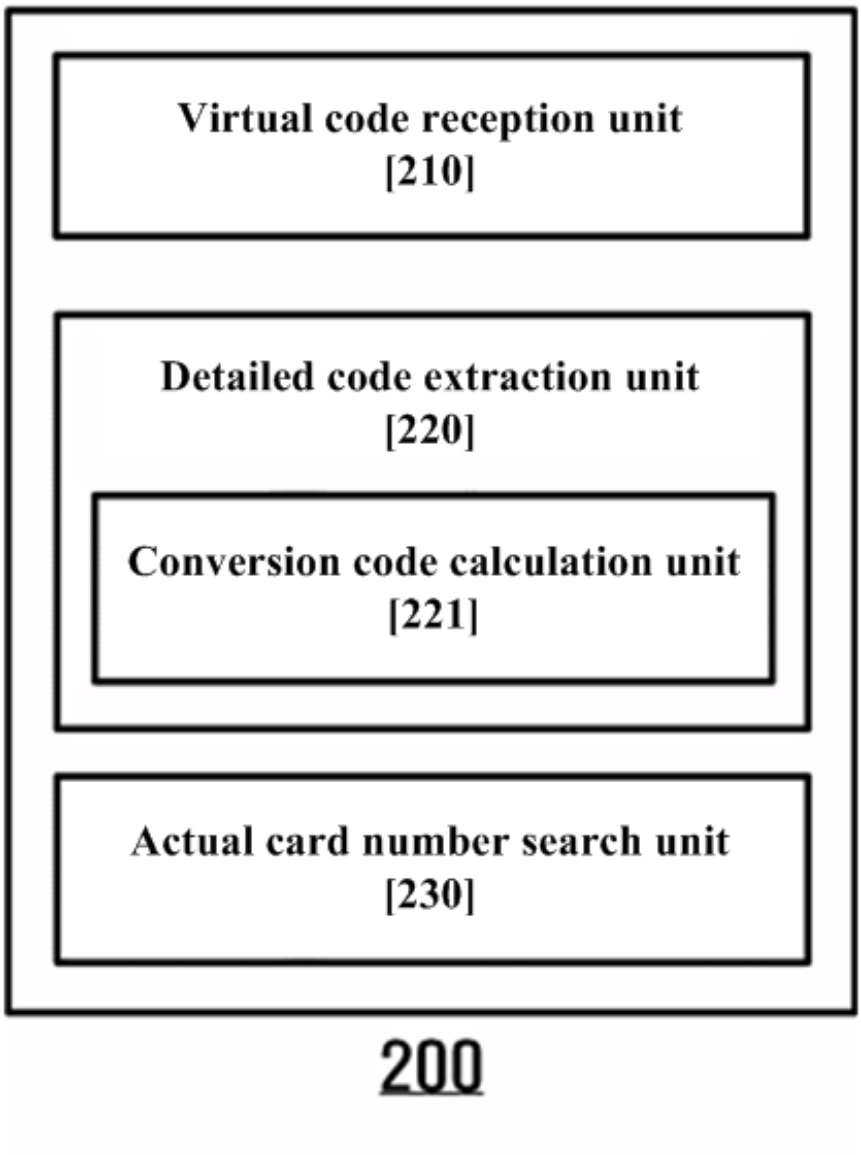

Virtual code reception unit
[210]
Detailed code extraction unit
[220]
Conversion code calculation unit
[221]
Actual card number search unit
[230]
200

Figure 9

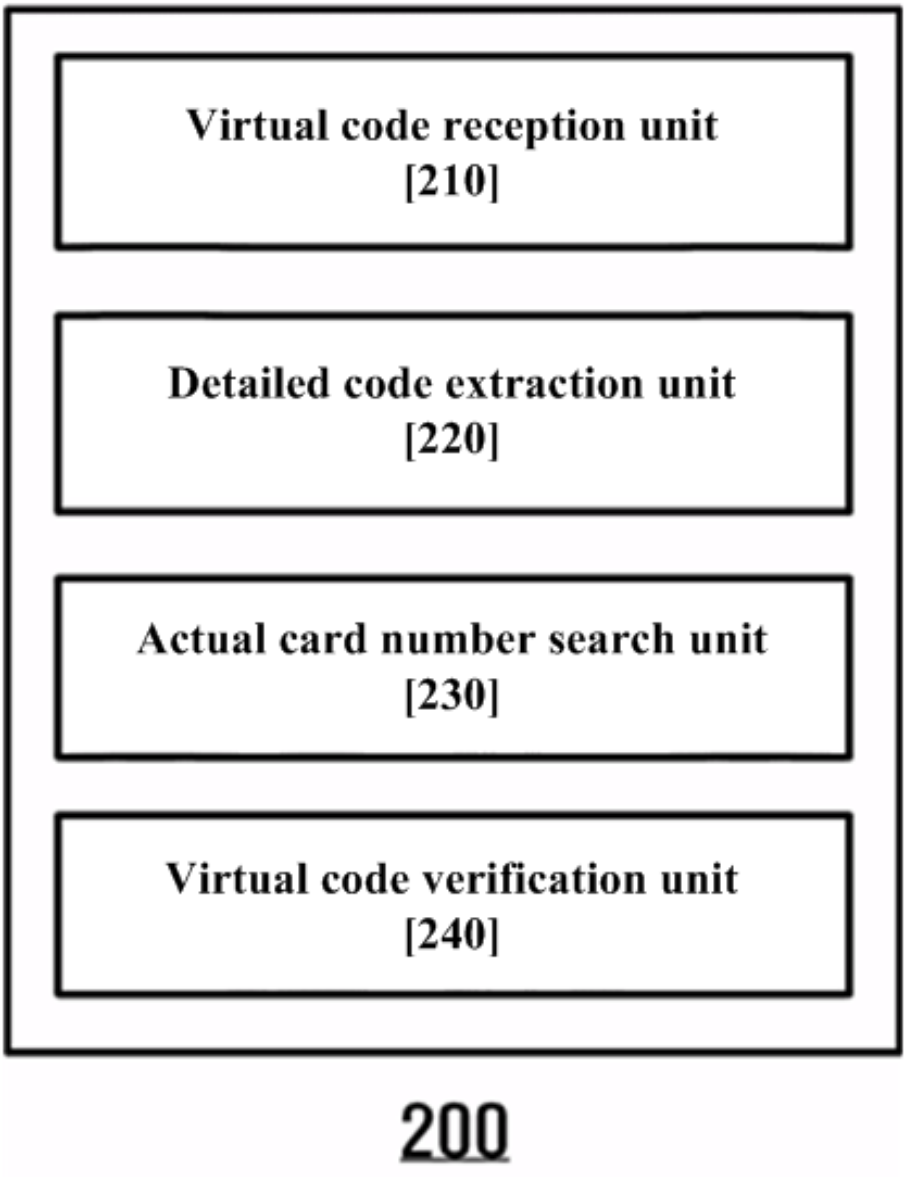

Virtual code reception unit
[210]
Detailed code extraction unit
[220]
Actual card number search unit
[230]
Virtual code verification unit
[240]
200

Figure 10

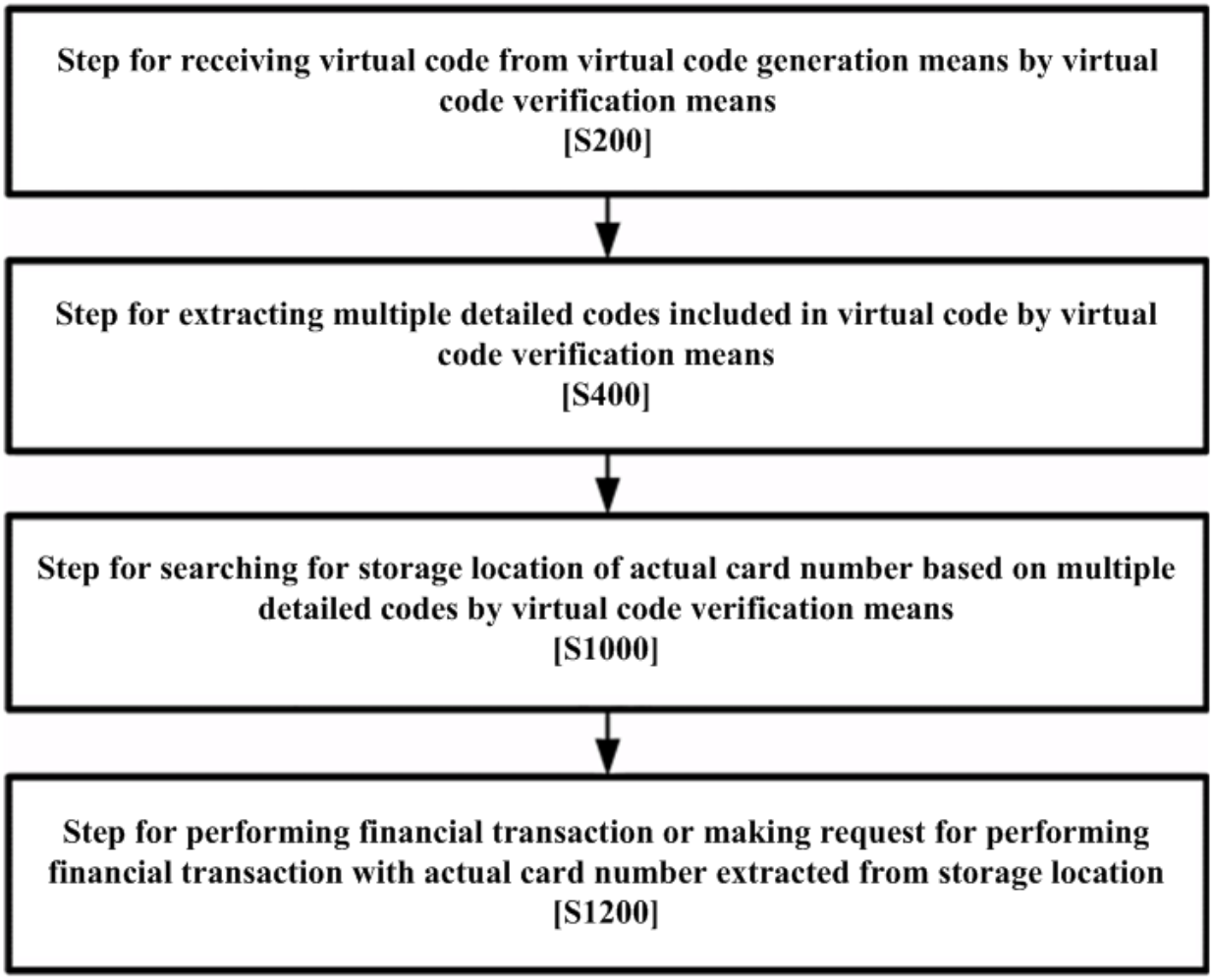

Step for receiving virtual code from virtual code generation means by virtual code verification means
[S200]
Step for extracting multiple detailed codes included in virtual code by virtual code verification means
[S400]
Step for searching for storage location of actual card number based on multiple detailed codes by virtual code verification means
[S1000]
Step for performing financial transaction or making request for performing financial transaction with actual card number extracted from storage location
[S1200]

Figure 11

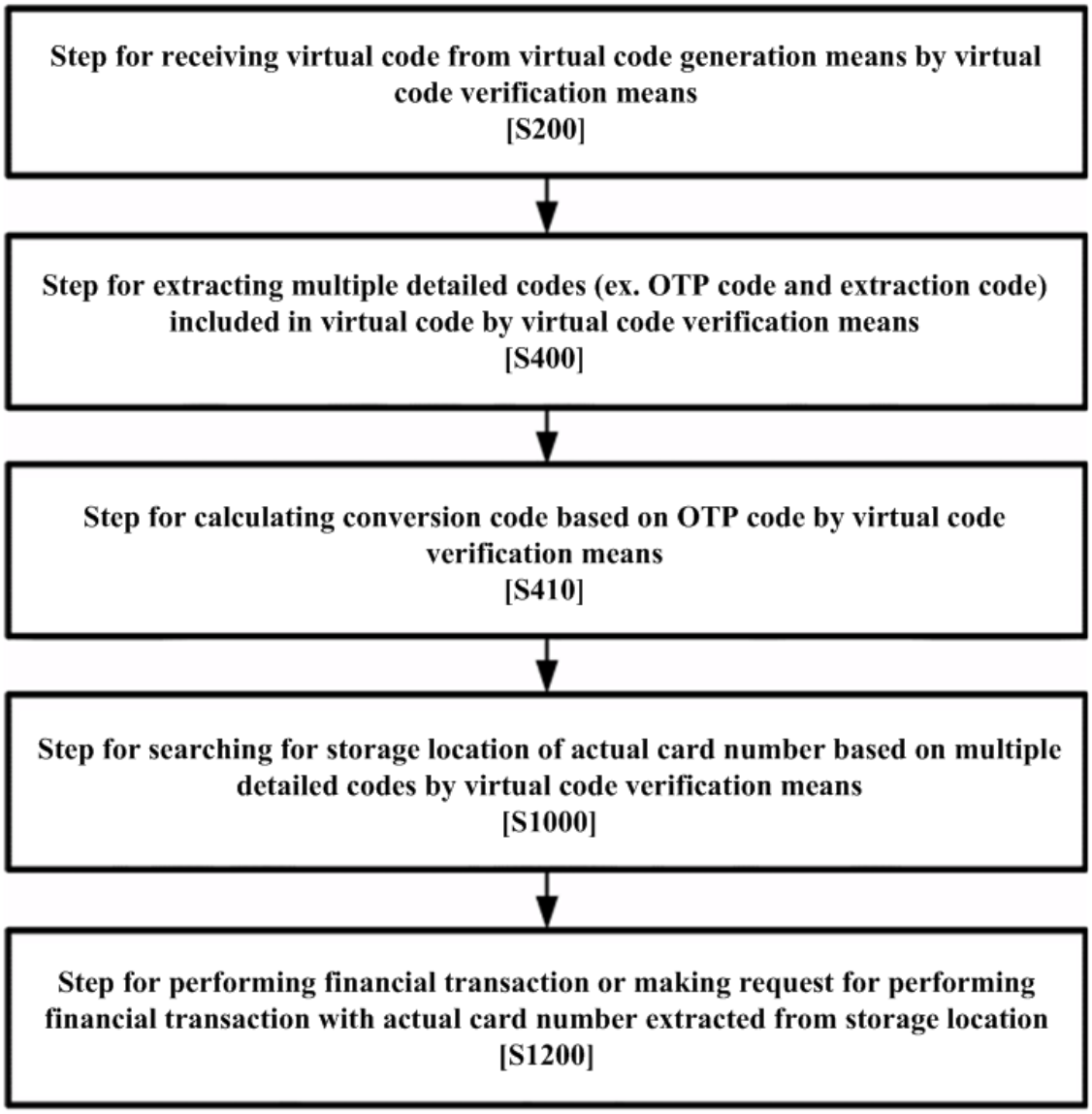

Step for receiving virtual code from virtual code generation means by virtual code verification means
[S200]
Step for extracting multiple detailed codes (ex. OTP code and extraction code) included in virtual code by virtual code verification means
[S400]
Step for calculating conversion code based on OTP code by virtual code verification means
[S410]
Step for searching for storage location of actual card number based on multiple detailed codes by virtual code verification means
[S1000]
Step for performing financial transaction or making request for performing financial transaction with actual card number extracted from storage location
[S1200]

Figure 12

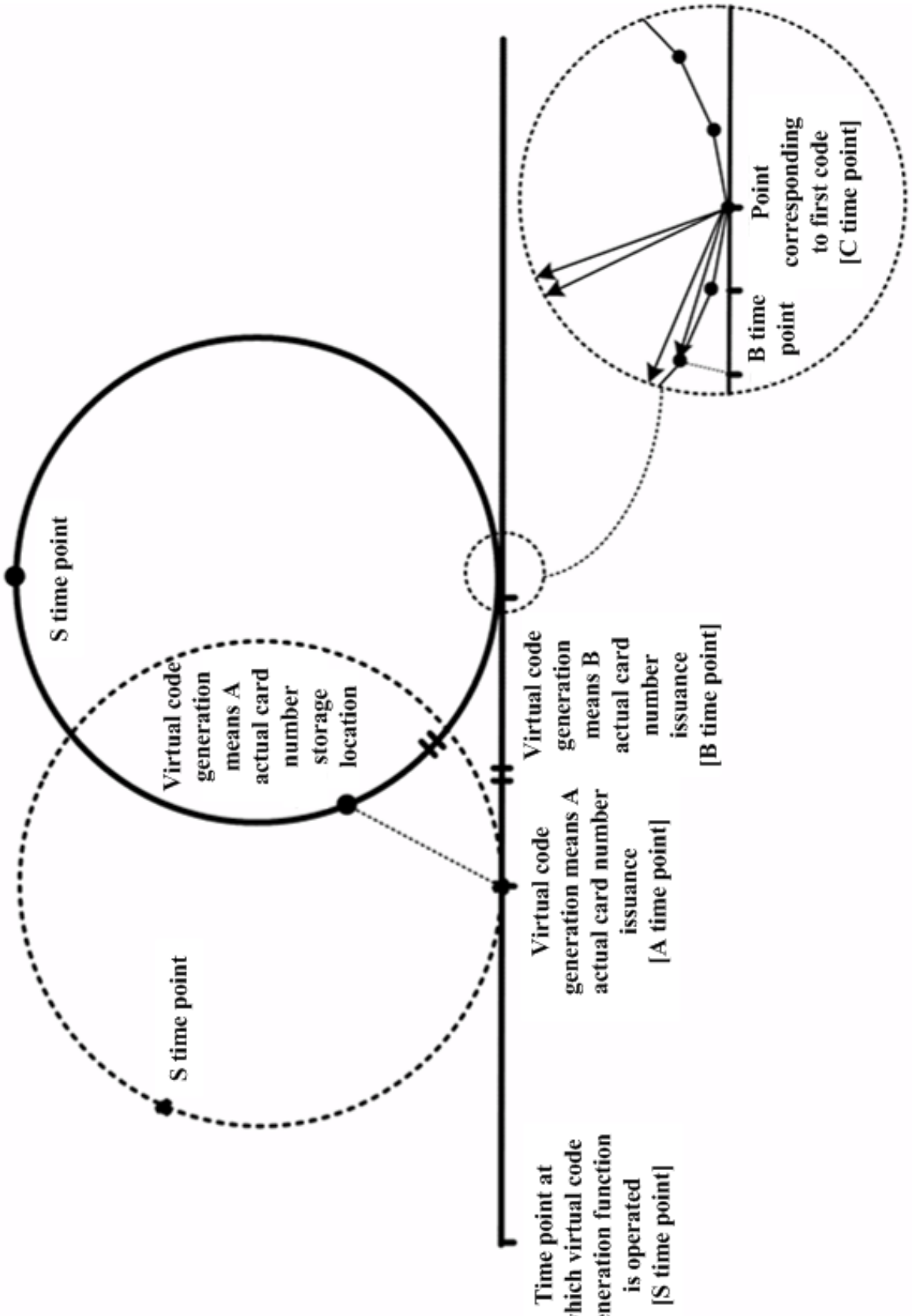

S time point
Virtual code generation means A actual card number storage location
S time point
Time point at which virtual code generation function is operated [S time point]
Virtual code generation means A actual card number issuance [A time point]
Virtual code generation means B actual card number issuance [B time point]
B time point
Point corresponding to first code [C time point]

Figure 13

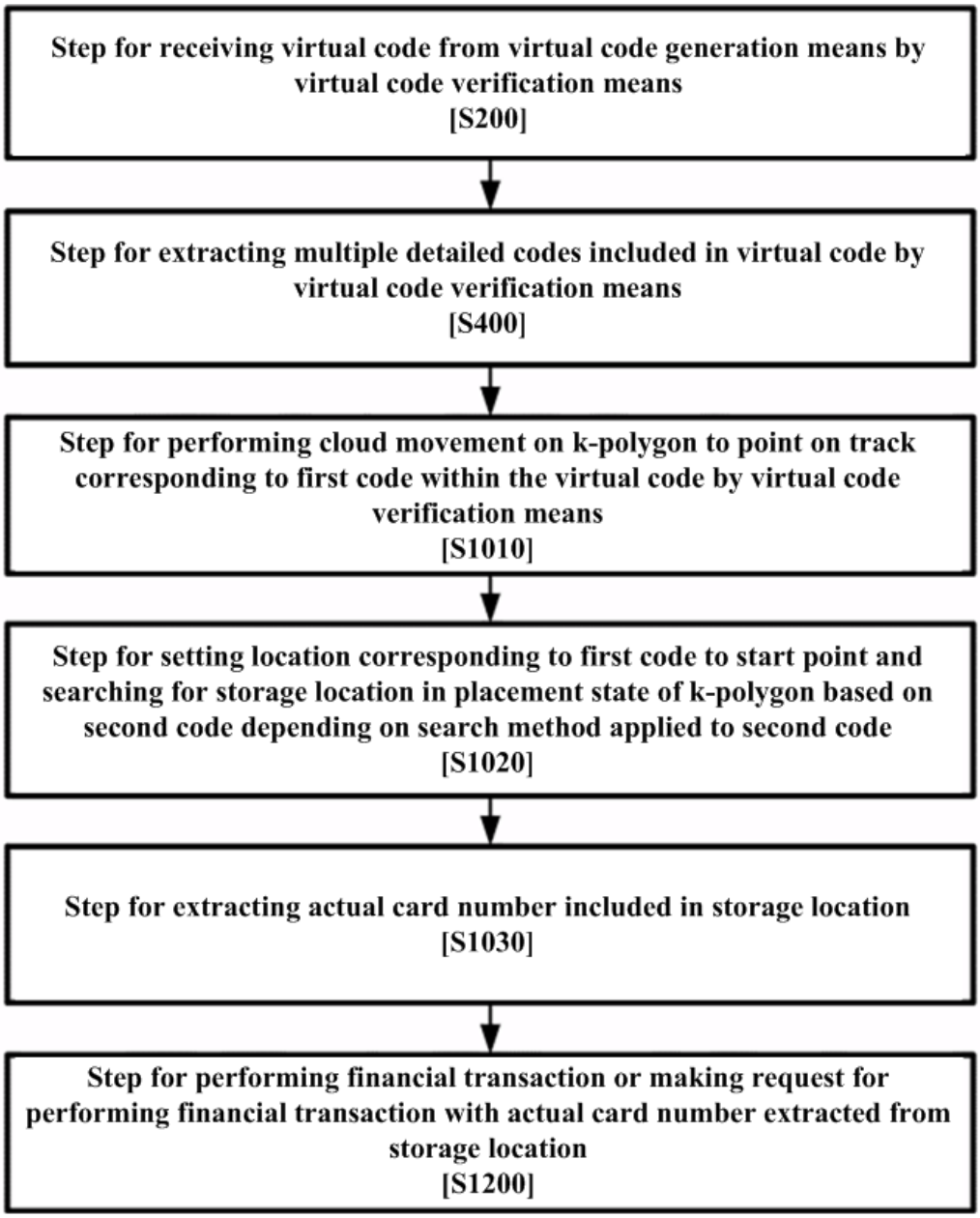

Step for receiving virtual code from virtual code generation means by virtual code verification means
[S200]
Step for extracting multiple detailed codes included in virtual code by virtual code verification means
[S400]
Step for performing cloud movement on k-polygon to point on track corresponding to first code within the virtual code by virtual code verification means
[S1010]
Step for setting location corresponding to first code to start point and searching for storage location in placement state of k-polygon based on second code depending on search method applied to second code
[S1020]
Step for extracting actual card number included in storage location
[S1030]
Step for performing financial transaction or making request for performing financial transaction with actual card number extracted from storage location
[S1200]

Figure 14

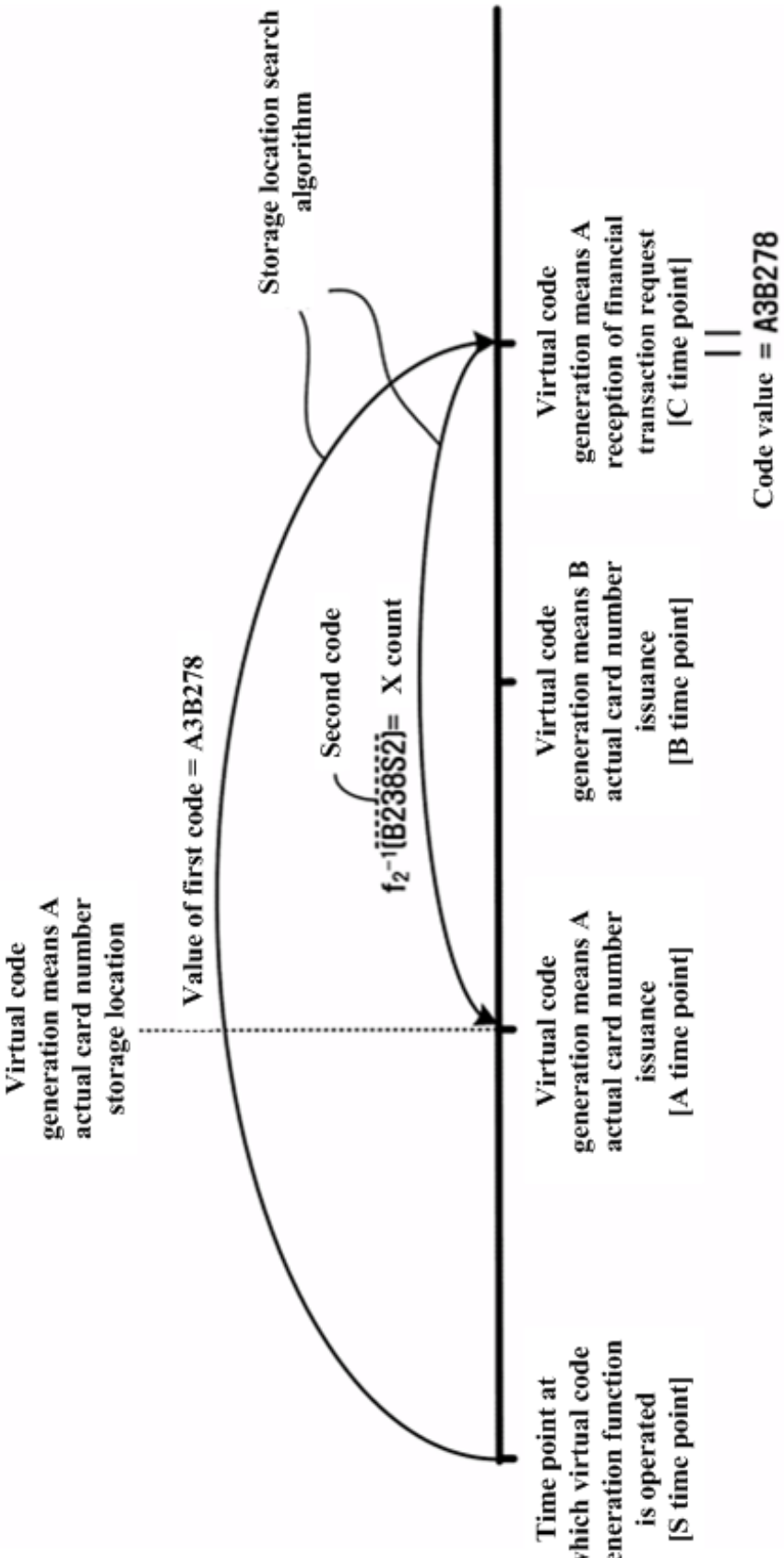

Virtual code generation means A actual card number storage location
Value of first code = A3B278
Second code
$f_2^{-1}[\ddot{B}\ddot{2}\ddot{3}8\ddot{S}\ddot{2}]$= X count
Storage location search algorithm
Time point at which virtual code generation function is operated [S time point]
Virtual code generation means A actual card number issuance [A time point]
Virtual code generation means B actual card number issuance [B time point]
Virtual code generation means A reception of financial transaction request [C time point]
Code value = A3B278

Figure 15

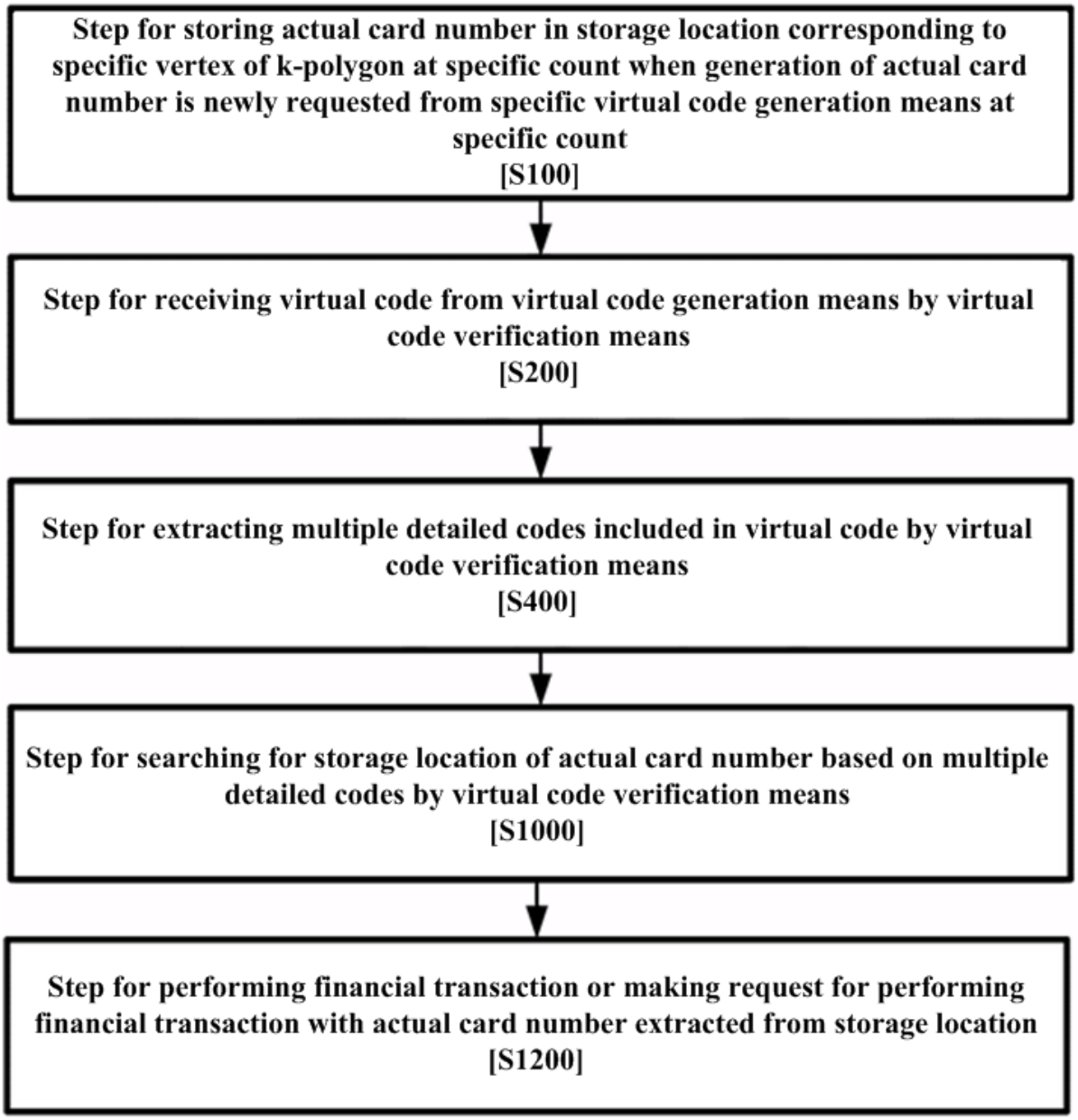

Step for storing actual card number in storage location corresponding to specific vertex of k-polygon at specific count when generation of actual card number is newly requested from specific virtual code generation means at specific count
[S100]
Step for receiving virtual code from virtual code generation means by virtual code verification means
[S200]
Step for extracting multiple detailed codes included in virtual code by virtual code verification means
[S400]
Step for searching for storage location of actual card number based on multiple detailed codes by virtual code verification means
[S1000]
Step for performing financial transaction or making request for performing financial transaction with actual card number extracted from storage location
[S1200]

Figure 16

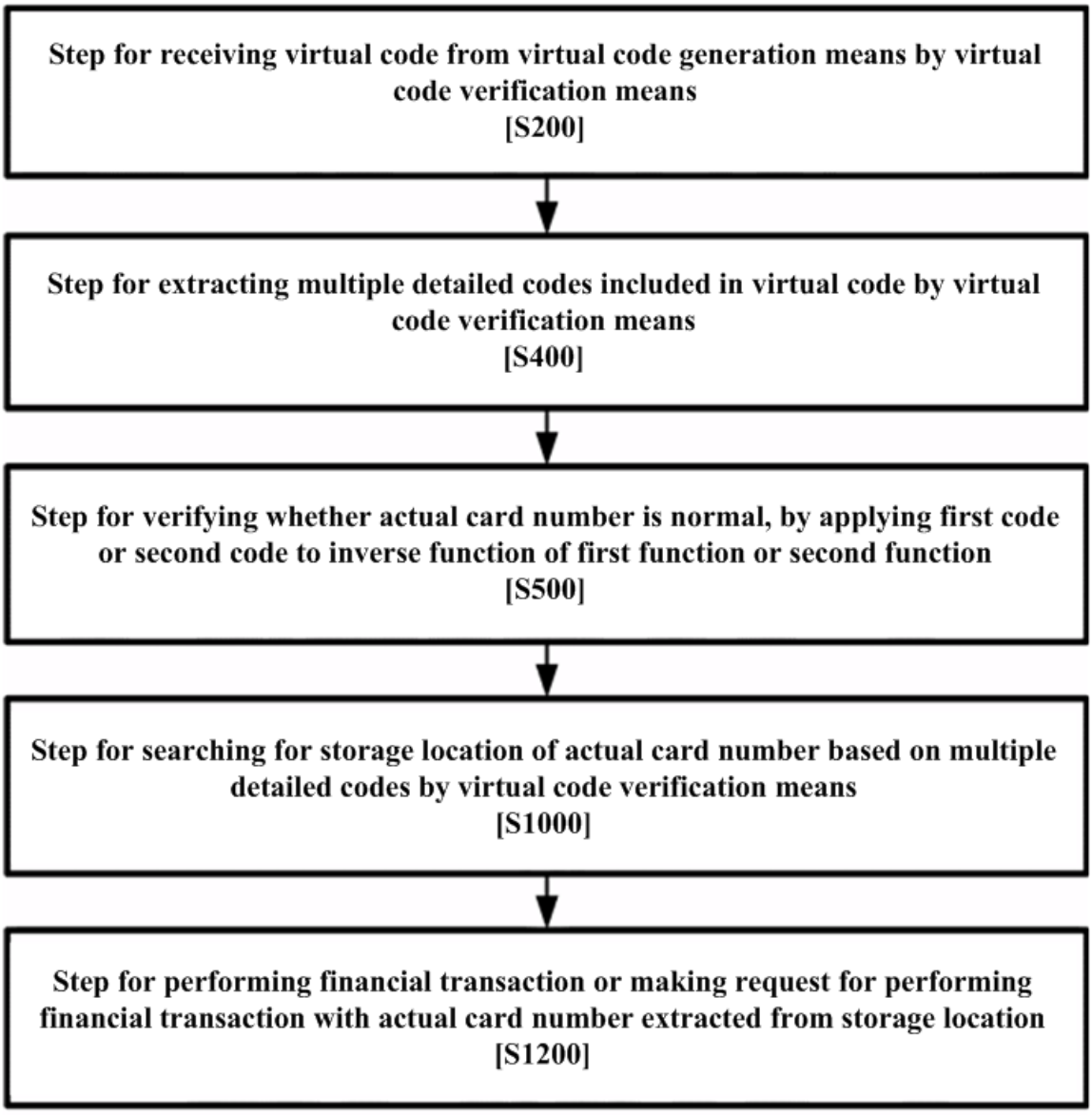

Step for receiving virtual code from virtual code generation means by virtual code verification means
[S200]
Step for extracting multiple detailed codes included in virtual code by virtual code verification means
[S400]
Step for verifying whether actual card number is normal, by applying first code or second code to inverse function of first function or second function
[S500]
Step for searching for storage location of actual card number based on multiple detailed codes by virtual code verification means
[S1000]
Step for performing financial transaction or making request for performing financial transaction with actual card number extracted from storage location
[S1200]

Figure 17

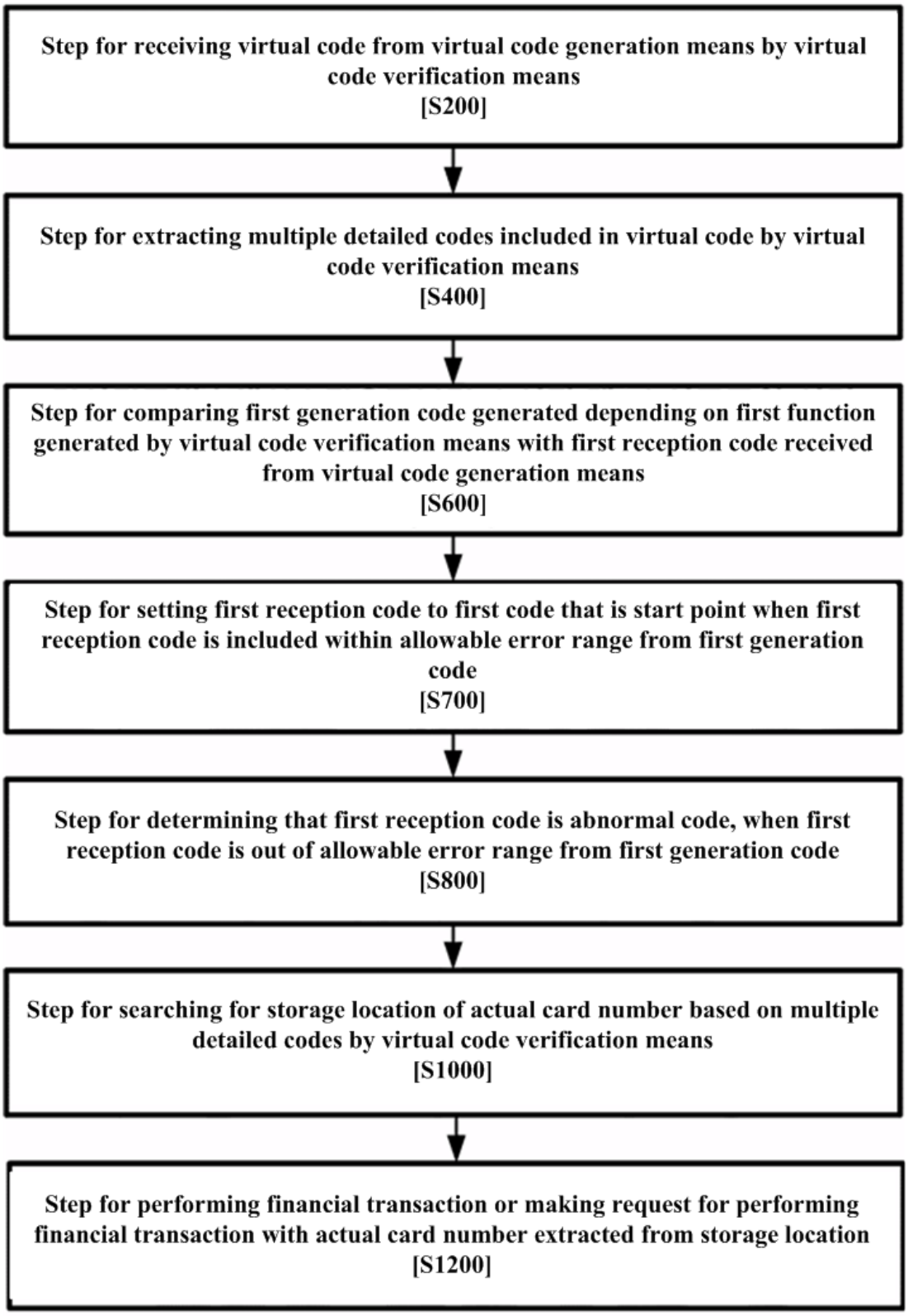
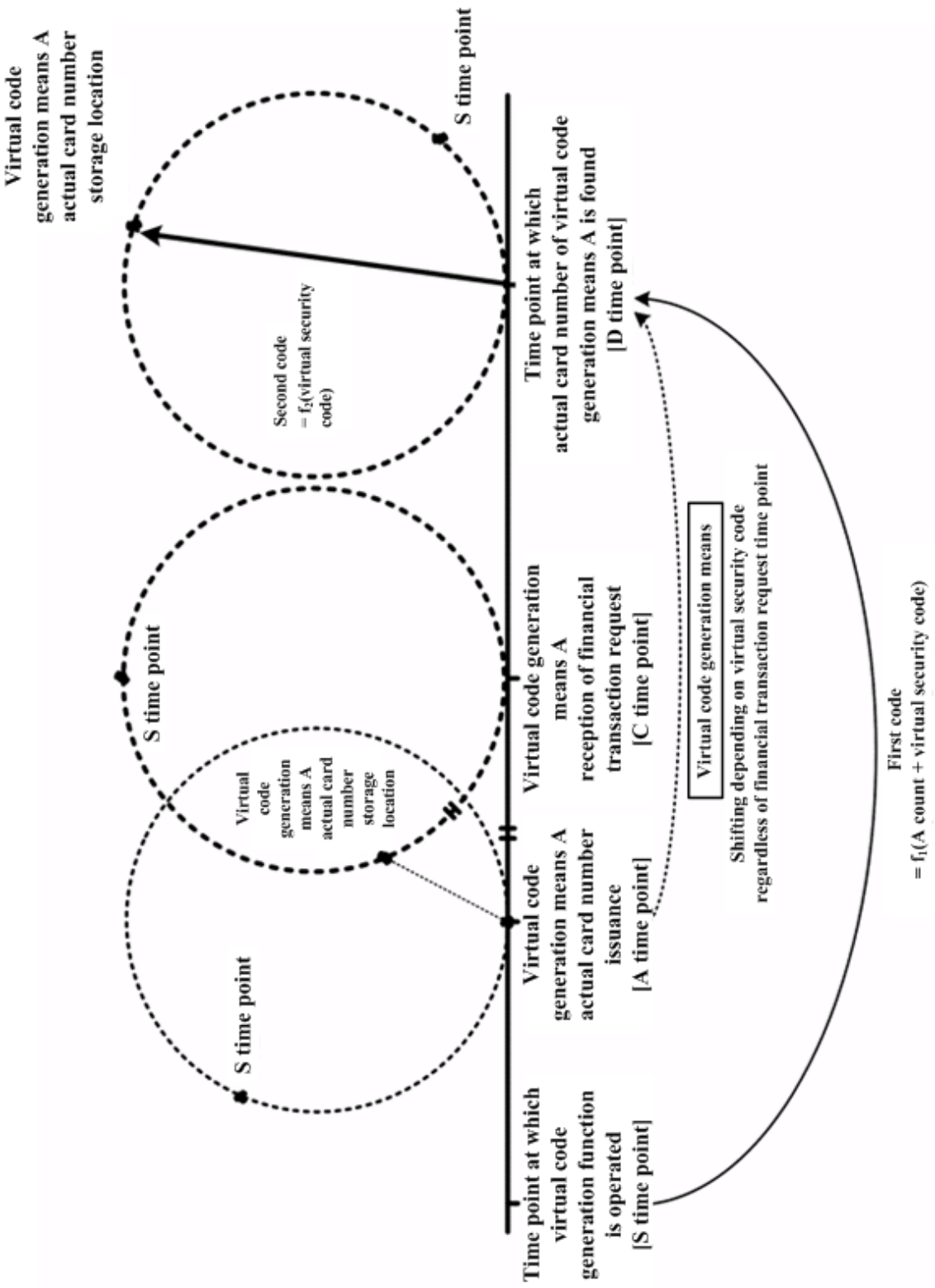

Step for receiving virtual code from virtual code generation means by virtual code verification means
[S200]
Step for extracting multiple detailed codes included in virtual code by virtual code verification means
[S400]
Step for comparing first generation code generated depending on first function generated by virtual code verification means with first reception code received from virtual code generation means
[S600]
Step for setting first reception code to first code that is start point when first reception code is included within allowable error range from first generation code
[S700]
Step for determining that first reception code is abnormal code, when first reception code is out of allowable error range from first generation code
[S800]
Step for searching for storage location of actual card number based on multiple detailed codes by virtual code verification means
[S1000]
Step for performing financial transaction or making request for performing financial transaction with actual card number extracted from storage location
[S1200]

Figure 18


Virtual code generation means A actual card number storage location
S time point
Second code = f2(virtual security code)
S time point
Virtual code generation means A actual card number storage location
S time point
Time point at which virtual code generation function is operated [S time point]
Virtual code generation means A actual card number issuance [A time point]
Virtual code generation means A reception of financial transaction request [C time point]
Time point at which actual card number of virtual code generation means A is found [D time point]
Virtual code generation means
Shifting depending on virtual security code regardless of financial transaction request time point
First code = f1(A count + virtual security code)